



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,675	07/14/2003	Maryellen L. Giger	239738US20	4119

22850 7590 12/27/2006  
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
----------

AKHAVANNIK, HADI

ART UNIT	PAPER NUMBER
----------	--------------

2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/27/2006	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No. 10/617,675	Applicant(s) GIGER ET AL.	
	Examiner Hadi Akhavannik	Art Unit 2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/1/04, 5/11/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-12, 15, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giger et al. (5657362, referred to as "Giger" herein) in view of Smith et al. (6253210, referred to as "Smith" herein).

Regarding claim 1, Giger discloses obtaining segmented image data of a portion of the medical image data corresponding to an abnormality (see abstract and column 4 lines 7-35 discloses receiving a segmented image of the breast);

extracting at least one abnormality feature from the segmented image data corresponding to the abnormality (column 6 lines 40-65 discloses extracting a lesion portion);

Giger discloses judging the quality of the abnormality feature in column 6 line 66 to column 7 line 15 but Giger does not explicitly disclose determining the prognosis based on the abnormality.

Smith discloses determining the prognosis based on the extracted at least one abnormality feature (column 9 lines 6-33 discloses an automated prognosis method). Also please note that figure 6 of Smith discloses parenchymal regions of the brain.

It would have been obvious at the time of the invention to one of ordinary skill in the art to combine in Giger a prognosis method as taught by Smith. The reason for the

Art Unit: 2624

combination is because it makes for a more robust system that is able to present an operator with a prognosis so to make for more efficient treatment planning. Also both inventions are from the same field of endeavor of medical imaging.

Regarding claim 2, the combination of Giger and Smith disclose obtaining segmented image data of a portion of the medical image data corresponding to a parenchymal region (see figure 6 of Smith and column 7 lines 52-60 and column 8 lines 8-22 discloses examining a parenchymal region);

and extracting at least one parenchymal feature from the segmented image data corresponding to the parenchymal region (column 8 lines 8-15 discloses finding abnormalities in the parenchymal region),

wherein the determining step comprises determining the prognosis on recovery based additionally on the extracted at least one parenchymal feature (as noted in the rejection of claim 1, figure 6 of Smith discloses examining tumors in the brain which includes parenchymal regions of the brain. Therefore the prognosis is based on the parenchymal region of the brain and the abnormalities found in claim 1).

Regarding claim 17, please see the rejection of claim 2 above as it discloses all aspects of claim 17.

Regarding claim 3, Giger discloses determining the contrast corresponding the parenchymall region (see column 6 lines 53-65 disclosing finding intensity based features)

Art Unit: 2624

Regarding claim 4, Giger discloses in column 7 lines 34-60 that an image is received that includes but abnormalities and regions free from abnormalities. The data is analyzed to determine potential abnormalities.

Regarding claim 5, Giger discloses in column 6 line 66 to column 7 lines 33 discloses locating a region and performing region growing.

Regarding claim 6, Giger discloses mammographic image data (see abstract).

Regarding claim 7, Giger discloses radial gradient index (see column 6 lines 54-60)

Regarding claim 8, see Giger, column 7 lines 34-51 discloses dense portion analysis.

Regarding claim 9, see Giger, column 5 lines 15-33, disclose gray level of the ROI.

Regarding claim 10, Giger discloses determining speculation measure in column 8 lines 23-36.

Regarding claim 11, the rejection of claim 10 discloses determining the speculation based on histogram enhancement and edge enhancement.

Regarding claims 12 and 15, Giger discloses using an ANN in column 8 lines 1-5. Giger discloses using ANN on both the parenchymal and lesion region.

Regarding claims 18-19, please see column 1, lines 7-19 of Giger as it discloses the method is computerized.

Art Unit: 2624

2. Claims 13, 16 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giger in view of Smith as applied to claim 1 above and in further view of Huo et al. (6282305, referred to "Huo" herein).

Regarding claim 13, the rejection of claim 1 discloses all aspects of claim 13 except it does not explicitly disclose using a linear discriminant.

Huo discloses applying the extracted at least one abnormality feature to a linear discriminant that classifies the abnormality at an output of the linear discriminant (see column 17 line 46 to column 18 line 55 as it discloses using linear discriminant to classify an abnormality).

It would have been obvious at the time of the invention to one of ordinary skill in the art to include Smith and Giger a linear discriminant analysis (LDA) means as taught by Huo. The reason for the combination is because LDA is a well known and established statistical technique that can classify into two groups of cases (see motivation by Huo in column 17 lines 63-67).

Regarding claim 16, please see the rejection of claim 13 above as it discloses all aspects of claim 16.

Regarding claims 18-19, please see column 1, lines 7-19 of Giger as it discloses the method is computerized.

3. Claim 14 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giger in view of Smith in view of Huo as applied to claim 13 above and in further view of Armato, III et al. (6898303, referred to as "Armato" herein).

The rejection of claim 13 discloses a training classifier but does not disclose using metastatic disease in the process.

Armato discloses using metastatic disease in column 13 lines 19-38. Here Armato determines a higher probability of metastatic disease if the number of nodules is high.

It would have been obvious to include in Smith, Giger, and Huo a more intelligent classification means as taught by Armato. The reason for the combination is because it makes for a more robust system that is able to classify abnormalities into more specific categories.

Regarding claims 18-19, please see column 1, lines 7-19 of Giger as it discloses the method is computerized.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gilhuijs et al (6112112 discloses a method for assessing a tumor). Young (6956975, discloses breast cancer diagnosis). Gilhuijs et al (6317617, discloses lesion analysis).

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hadi Akhavannik whose telephone number is 571-272-8622. The examiner can normally be reached on 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone

Art Unit: 2624

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HA  
12/15/06



JOSEPH MANCUSO  
SUPERVISORY PATENT EXAMINER